



Trickle Irrigation

Using and Conserving Water in the Home Garden

Although Maine normally receives ample annual precipitation, July and August can be very dry. Long periods of dry weather may appreciably reduce the yield of a home garden. The critical time for vegetable production often coincides with our driest weather. Your plants need from one to two inches of water per week during the growing season for best production. Many gardeners help maintain soil moisture by mulching, hand weeding or adding organic matter. During extended dry periods these cultural practices may not be enough, so additional water may be required. Proper watering techniques will conserve water.

Water is typically lost in three ways when applied to home gardens:

- Water is applied too rapidly and runs off the soil surface rather than soaking into the soil.
- Water is applied to bare soil surfaces and evaporates.
- Water is applied through a sprinkler system and evaporates before reaching the soil.

By watering the right amount, at the proper time, and in the most effective way, you can conserve water and improve plant health. Trickle or “drip” irrigation is one of the most efficient methods of applying water in the home garden.

What is Trickle Irrigation?

Trickle irrigation, sometimes referred to as drip irrigation, is a low-pressure system that places water slowly and directly in the root zone of the desired plant, increasing the efficiency of the water applied. Trickle irrigation can reduce water usage by 30 to 70 percent compared to more traditional means of irrigation, such as overhead sprinklers or hand watering.

Trickle irrigation systems are operated at pressures between five and 15 pounds per square inch (PSI). Drip tape or trickle tubes are usually laid to the side of the plant row or between two rows.



Trickle irrigation shown with a header pipe and drip tape on bean crop.

Water seeps through small *emitters* that permit water to flow out of the pipe at a very slow rate. Emitters are located every four to 24 inches along the drip tape, depending on the desired wetting pattern and plant spacing.

Benefits of Trickle Irrigation

- **Water use is reduced.** Plants need the same amount of water no matter what the delivery method. Trickle irrigation places the water at the roots, where plants can use it best.
- **Fewer weeds germinate.** Water is directed to the crop, leaving the area between the rows dry, so weed seeds located there are less likely to germinate.
- **Fewer leaf diseases occur.** Wet leaves encourage fungal and bacterial plant diseases. Trickle irrigation does not wet leaves.
- **Wetting patterns are uniform.** In contrast, overhead irrigation allows the wind to evaporate water and distort wetting patterns.
- **Garden work can continue during watering.** Only a small area around the row of plants is irrigated. Walkways and between row areas remain dry.
- **Soil structure is not damaged from water falling on bare soil.**
- **Insecticide and fungicide use is reduced.** Trickle irrigation does not wash pesticides from the foliage.

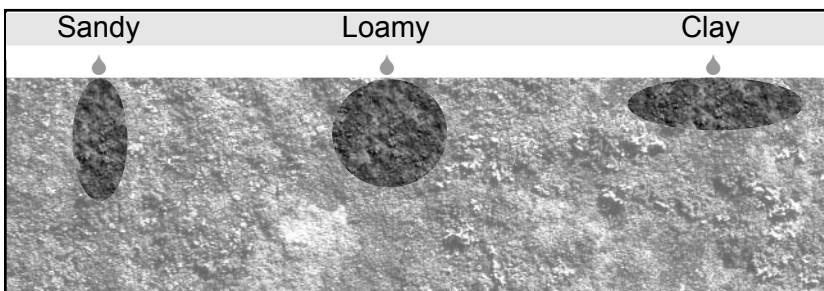
Disadvantages of Trickle Irrigation

- Time is required for initial planning and installation.
- It is more expensive than most sprinkler systems.
- The tiny emission holes can become clogged with soil particles, algae or mineral particles.
- Insects and rodents may damage the trickle line emitters.

Frequently Asked Questions About Trickle Irrigation

How expensive is a trickle irrigation system?

- The initial investment in trickle irrigation systems is higher than the cost of a traditional garden hose and sprinkler.
- The initial cost ranges from 40 to 100 dollars for a 400-square-foot garden. Look at the system as an investment over several years. Systems can easily be overdesigned. Homeowners without experience may want to start with a relatively simple system on a modest scale to gain experience.
- The drip tape will need to be replaced occasionally. The frequency of replacement depends on the quality of the tape and how carefully the tape is maintained.
- Your cost will depend on your desired outcome. More elaborate systems are more expensive but can save labor and increase water efficiency.



Wetting pattern of trickle irrigation in soils with different soil textures.

What can I use as a water source for trickle irrigation?

- Wells, ponds and municipal water sources are all good sources of water for the landscape and gardens. (Check first with local municipal officials regarding use of public water bodies.) Some coastal wells may contain too much salt for extended irrigation. This salt will build up in the soil over time.
- If your water source is a private well or public water supply, you will need to install a backflow valve in the system to prevent garden chemicals and other contaminants from being drawn into your domestic system.
- Surface water sources require a quality filter, at least 150 mesh opening size, to remove any organic material and soil particles that could clog the emitters.

How do I know when my garden needs to be irrigated?

- Check the soil! If the soil cannot be rolled into a ball, it is probably too dry. If the soil can be molded into a ball that crumbles when you rub it, it is probably just right. If the molded ball will not crumble when rolled, it is too wet.
- Check your plants! If the plants are wilted in the morning, the soil is probably too dry. Watering your plants slowly, deeply into the soil and less often will force the plant to develop a deeper root system than plants watered shallowly and often.

How do I determine what type of system is best for me?

Irrigation systems can be designed to fit almost every need. Determining the best system for your situation requires knowledge of your site, water requirements, water availability and planning. See the resources below to help you plan your system.

Resources

Broner, I. *Drip Irrigation for Home Gardens*. Colorado State University Cooperative Extension publication 4.702 (1998).

Order from Colorado State University Cooperative Extension, 1 Administration Building, Colorado State University, Fort Collins, CO 80523-4040. As of 6/13/03 available at <http://www.ext.colostate.edu/pubs/garden/04702.html>

Drinkwater, W. O. and H.E. Carpenter. *Trickle Irrigation for Home Gardens*. Rutgers University (reviewed 1994). As of 6/13/03 available at <http://www.cce.cornell.edu/suffolk/grownet/home-gardening-general/trickle.html>

VanDerZanden, A.M. *Conserving Water in the Garden: Designing and Installing a New Landscape*. Oregon State University Extension Service publication EC1530 (2001).

Order from Publication Orders, Extension and Experiment Station Communications, Oregon State University, 422 Kerr Administration, Corvallis, Oregon, 97331-2119 1-800-561-6719. Also available online as of 6/13/03 at <http://eesc.orst.edu/agcomwebfile/edmat/html/ec/ec1530/ec1530.html>

Prepared by Mark Hutchinson, Extension educator

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